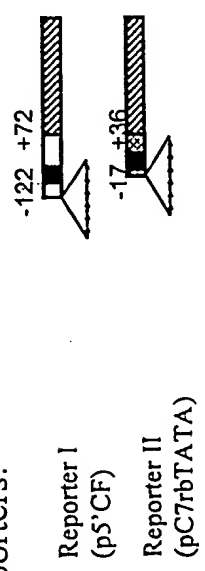


A

Reporters:



Activator (pND3008): 2C7-VP64 (six-finger ZFP)



B

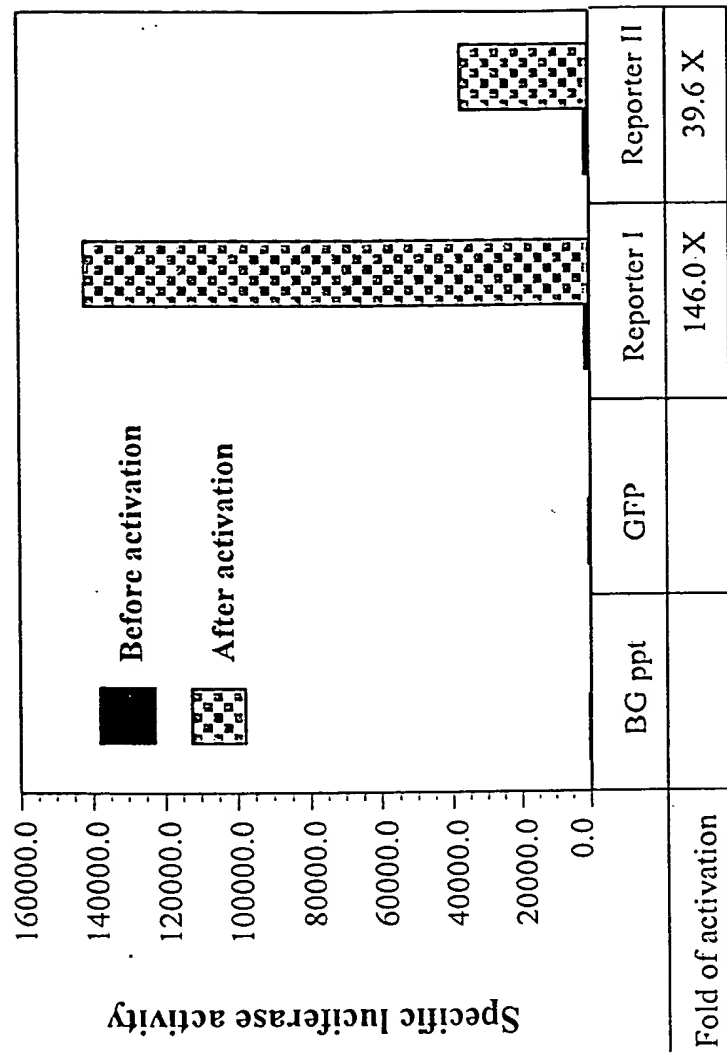
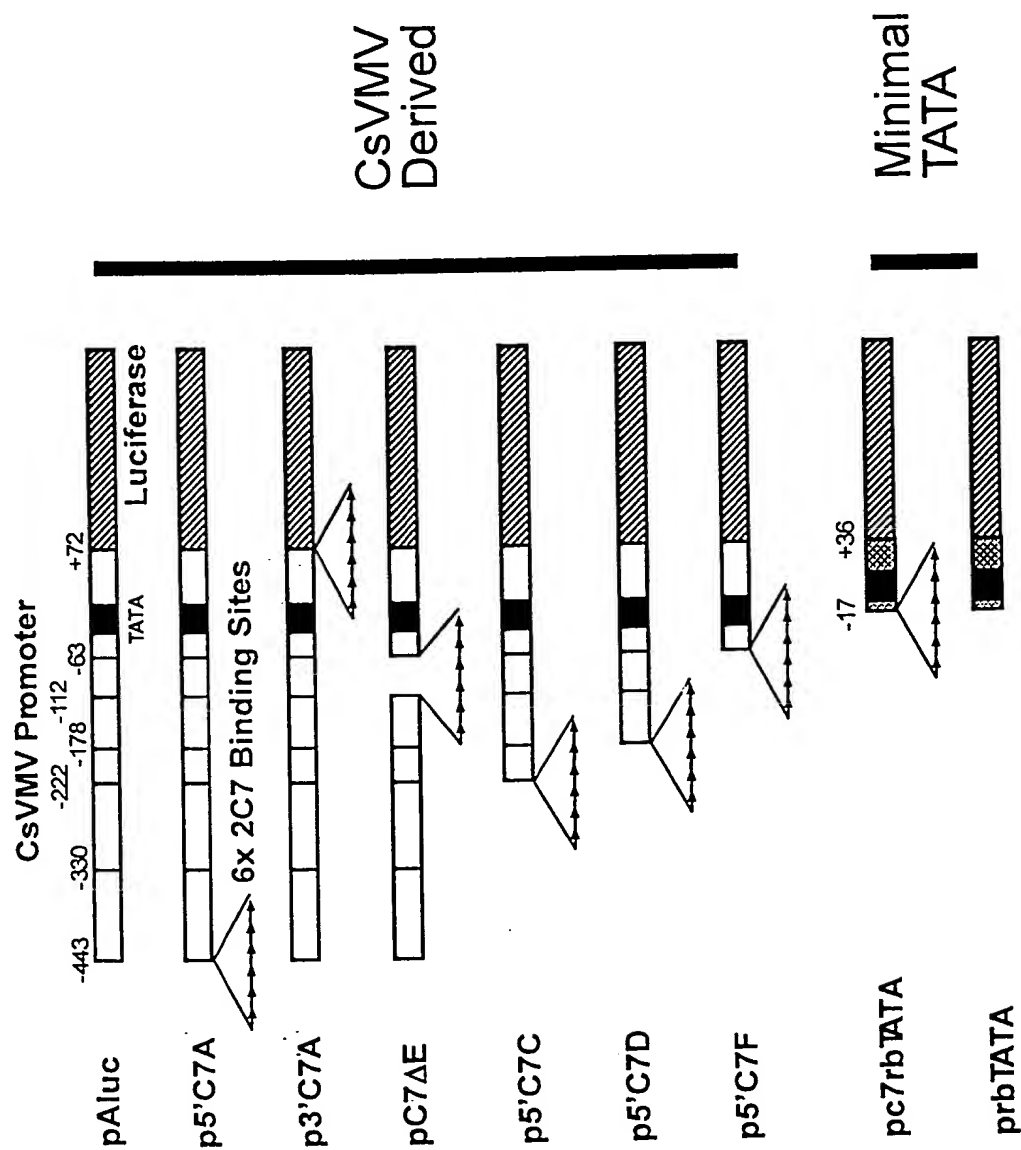


Figure 1



## Figure 2

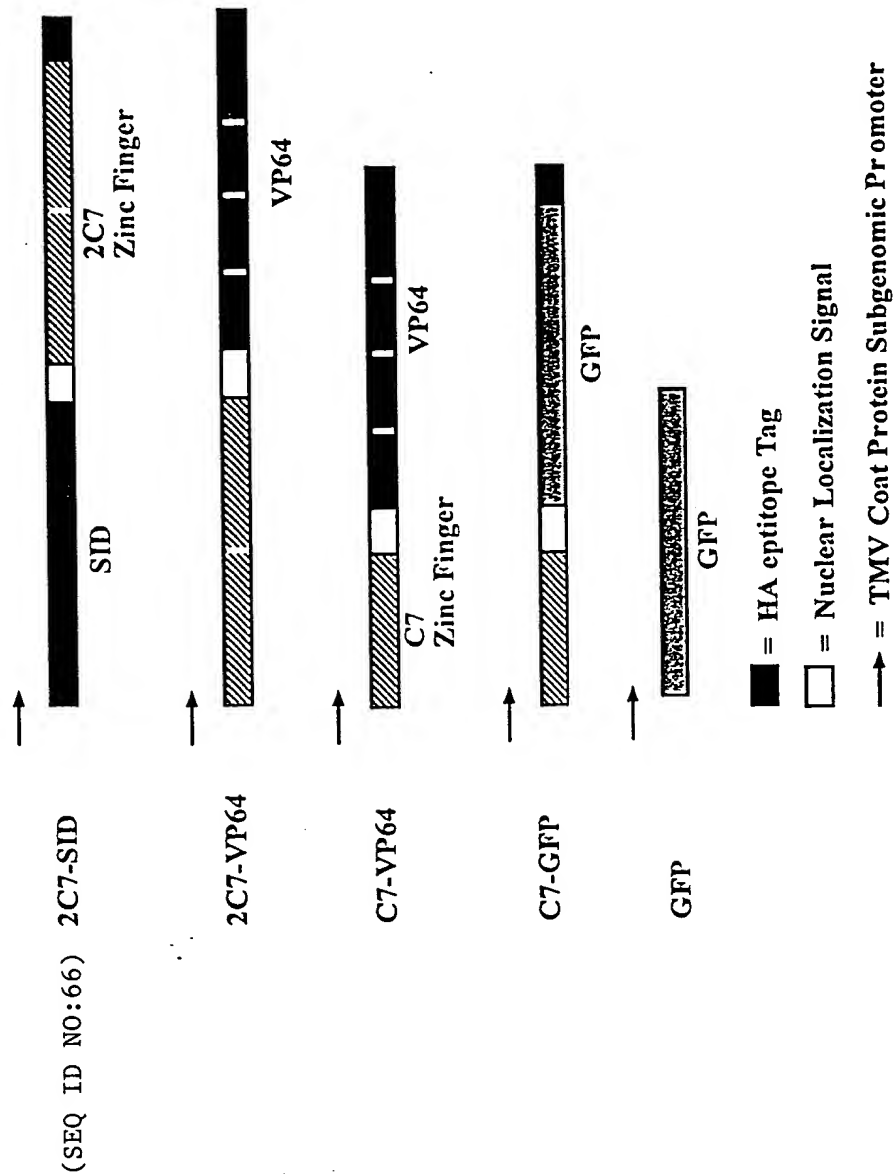


Figure 3

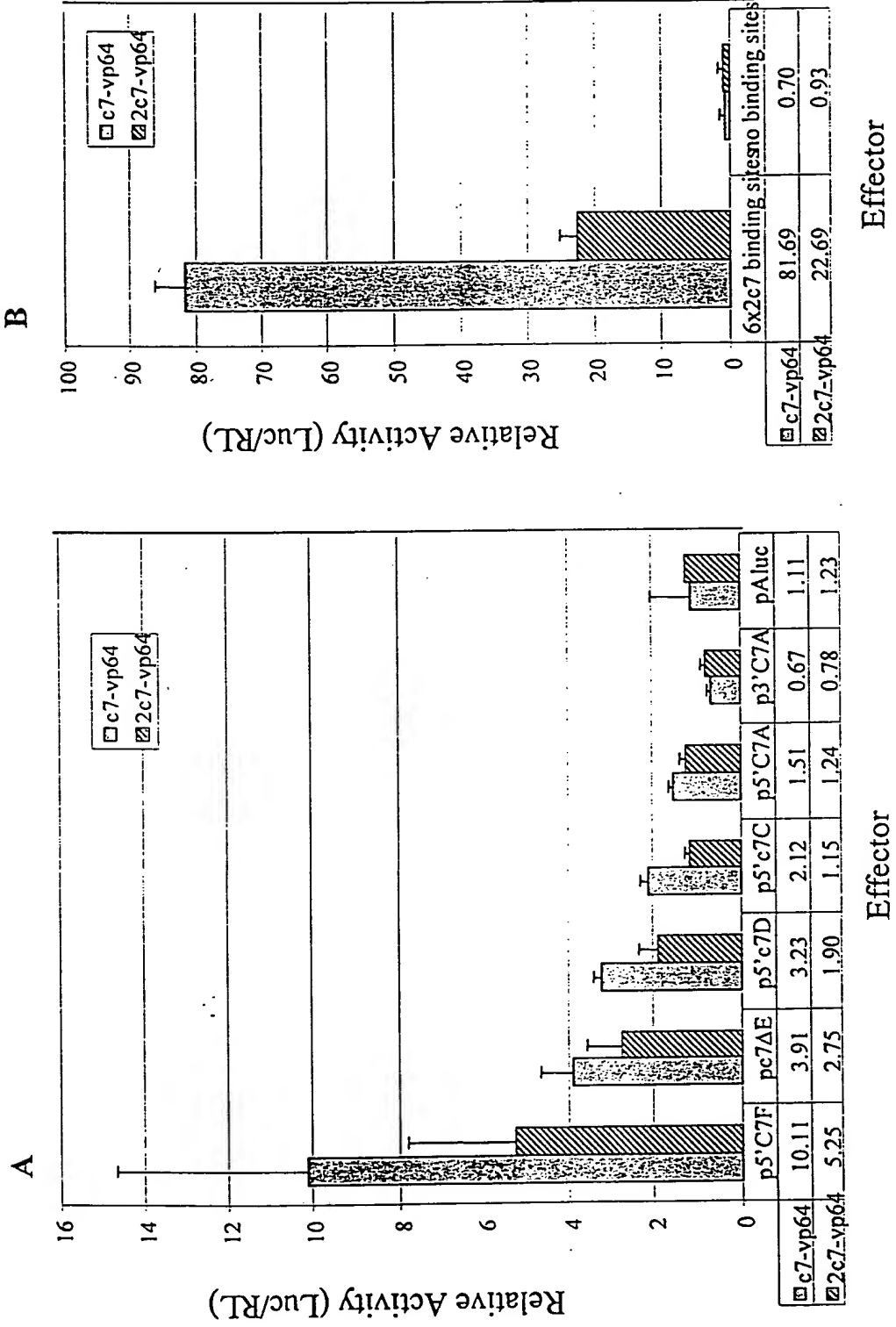


Figure 4

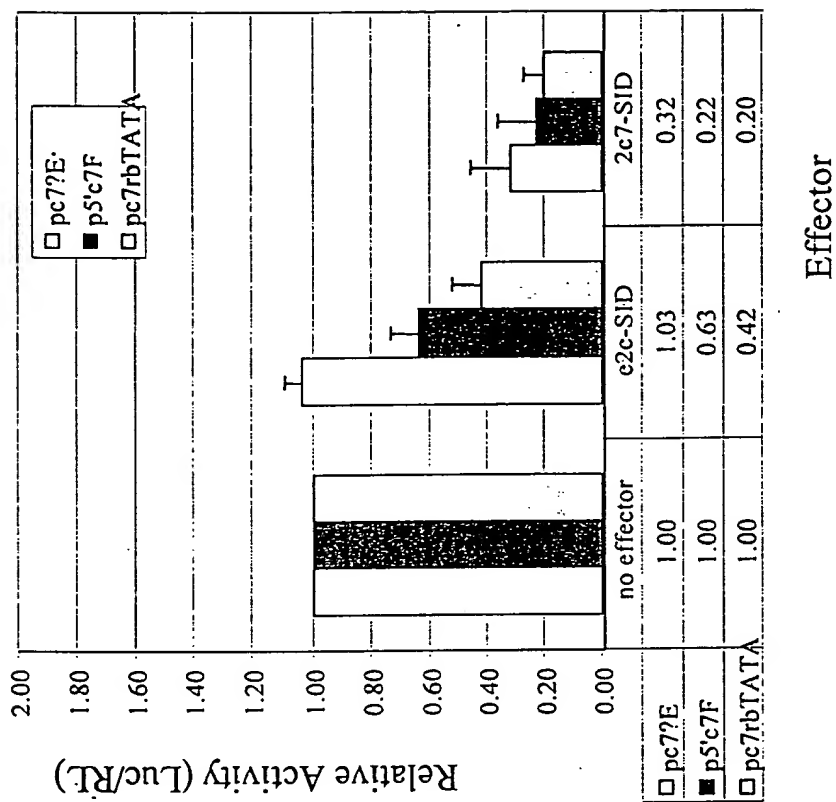


Figure 5

50

1 AQAALPGEKPYACPECGKSFSDPGLVVRHQRTHTGKPYKCECGKSF  
AQAALPGEKPYACPECGKSFSSHLVRHQRTHTGKPYKCECGKSF  
AQAALPGEKPYACPECGKSFSDPGLVVRHQRTHTGKPYKCECGKSF  
AQAALPGEKPYACPECGKSFSSSLVRHQRTHTGKPYKCECGKSF  
AQAALPGEKPYACPECGKSFSSSLVRHQRTHTGKPYKCECGKSF

F1

100

51 QRAHLERHQRTHTGKPYKCECGKSFSSNLVRHQRTHTGKPYACPE  
QSSNLVRHQRTHTGKPYKCECGKSFSSNLVRHQRTHTGKPYACPE  
TSGSLVRHQRTHTGKPYKCECGKSFSSSLVRHQRTHTGKPYACPE  
QSSSLVRHQRTHTGKPYKCECGKSFSDCRDLARHQRTHTGKPYACPE  
QSSNLVRHQRTHTGKPYKCECGKSFSSNLVRHQRTHTGKPYACPE

F2

F3

150

101 CGKSFSSDLVRHQRTHTGKPYKCECGKSFSSDLVRHQRTHTGK  
CGKSFSSDLVRHQRTHTGKPYKCECGKSFSSDLVRHQRTHTGK  
CGKSFSSSLVRHQRTHTGKPYKCECGKSFSDCRDLARHQRTHTGK  
CGKSFSSSLVRHQRTHTGKPYKCECGKSFSSDLVRHQRTHTGK  
CGKSFSSSLVRHQRTHTGKPYKCECGKSFSSSLVRHQRTHTGK

F4

F5

184

151 PYKCECGKSFSSQAGHLASHQRTHTGKKTSGQAG ZFPm1 (SEQ ID NO:38)  
PYKCECGKSFSSDLVRHQRTHTGKKTSGQAG ZFPm2 (SEQ ID NO:39)  
PYKCECGKSFSSHLVRHQRTHTGKKTSGQAG ZFPm3 (SEQ ID NO:40)  
PYKCECGKSFSSHLVRHQRTHTGKKTSGQAG ZFPm4 (SEQ ID NO:41)  
PYKCECGKSFSSDLVRHQRTHTGKKTSGQAG ZFPm3 (SEQ ID NO:42)

F6

Figure 6

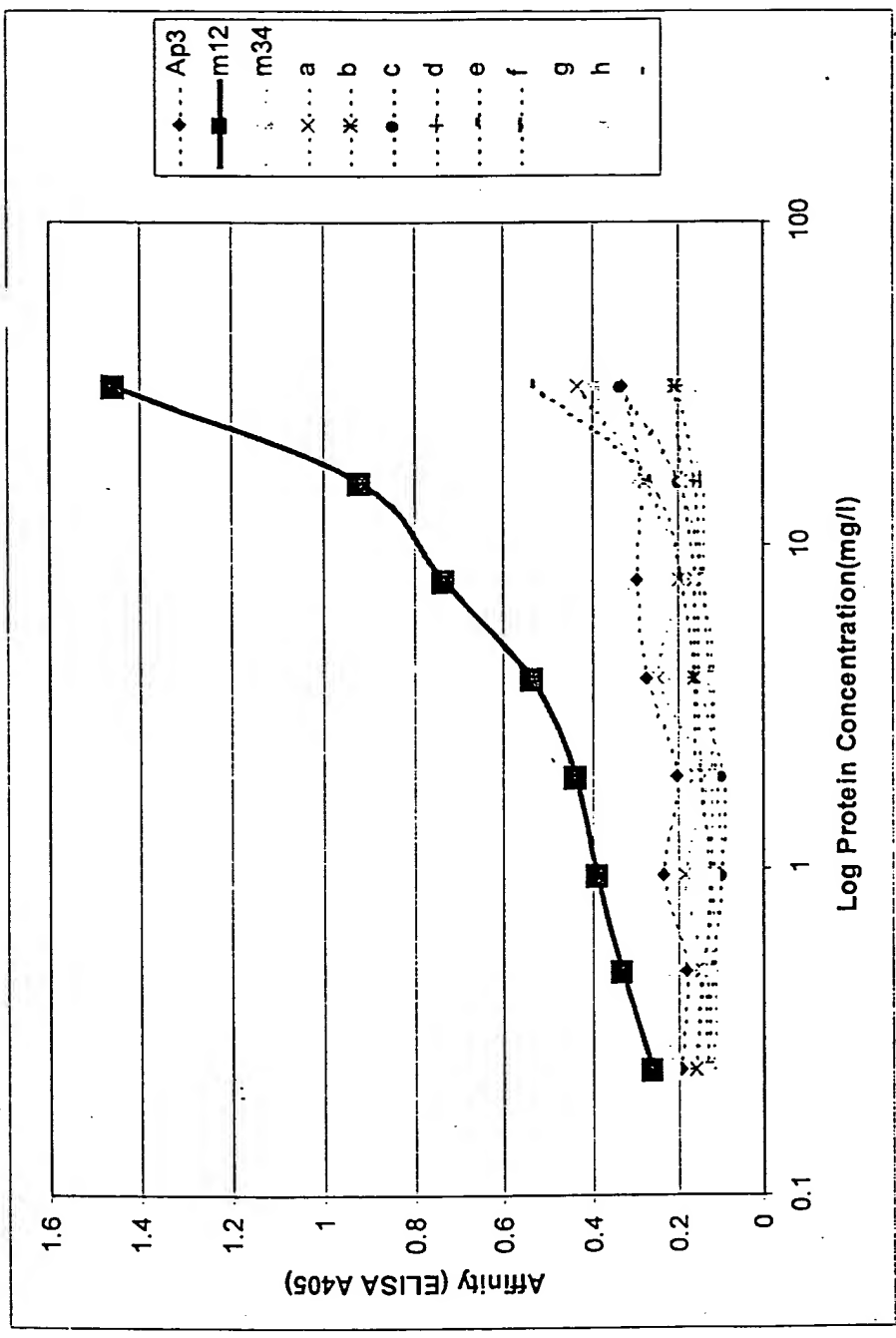


FIGURE 7

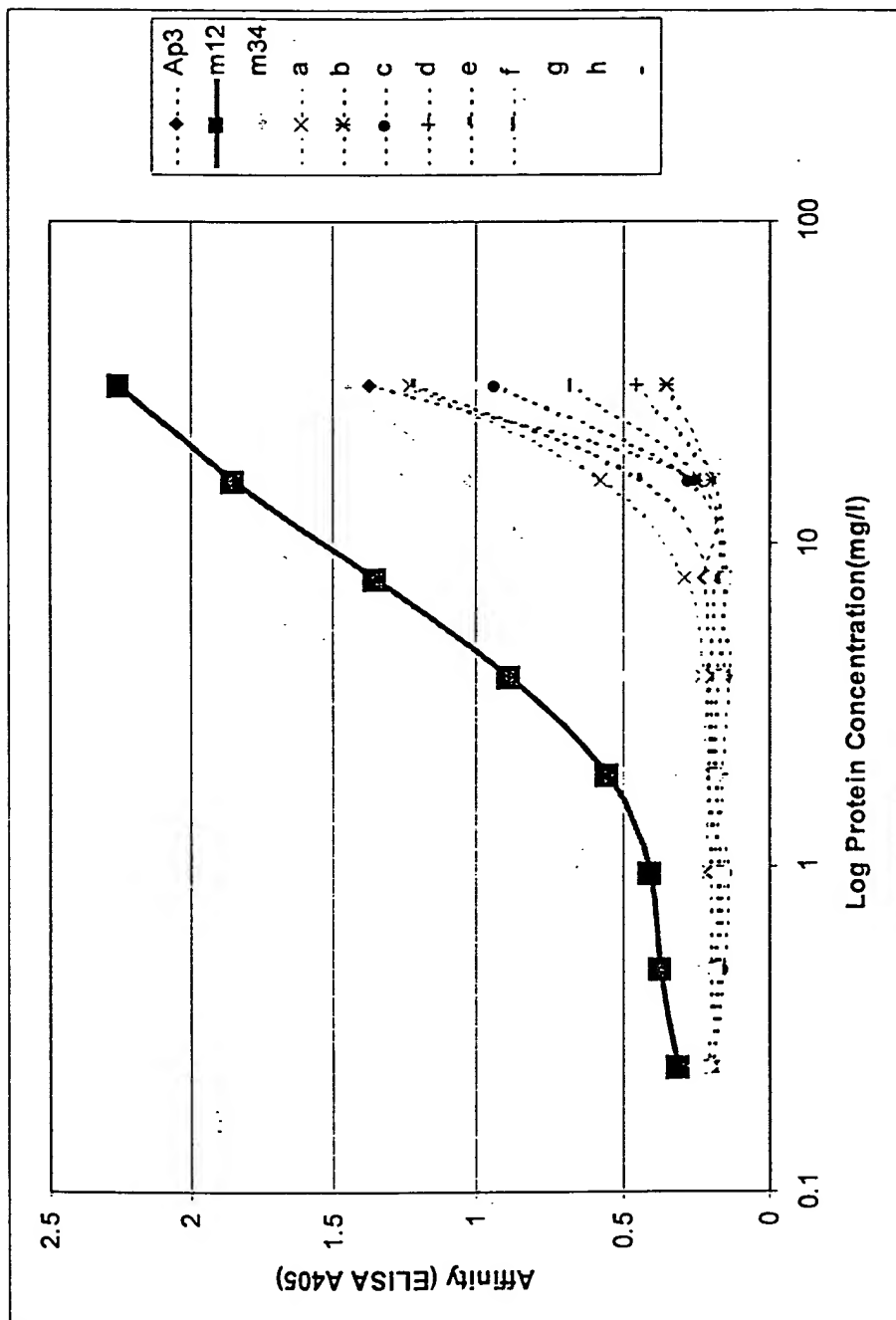


FIGURE 8



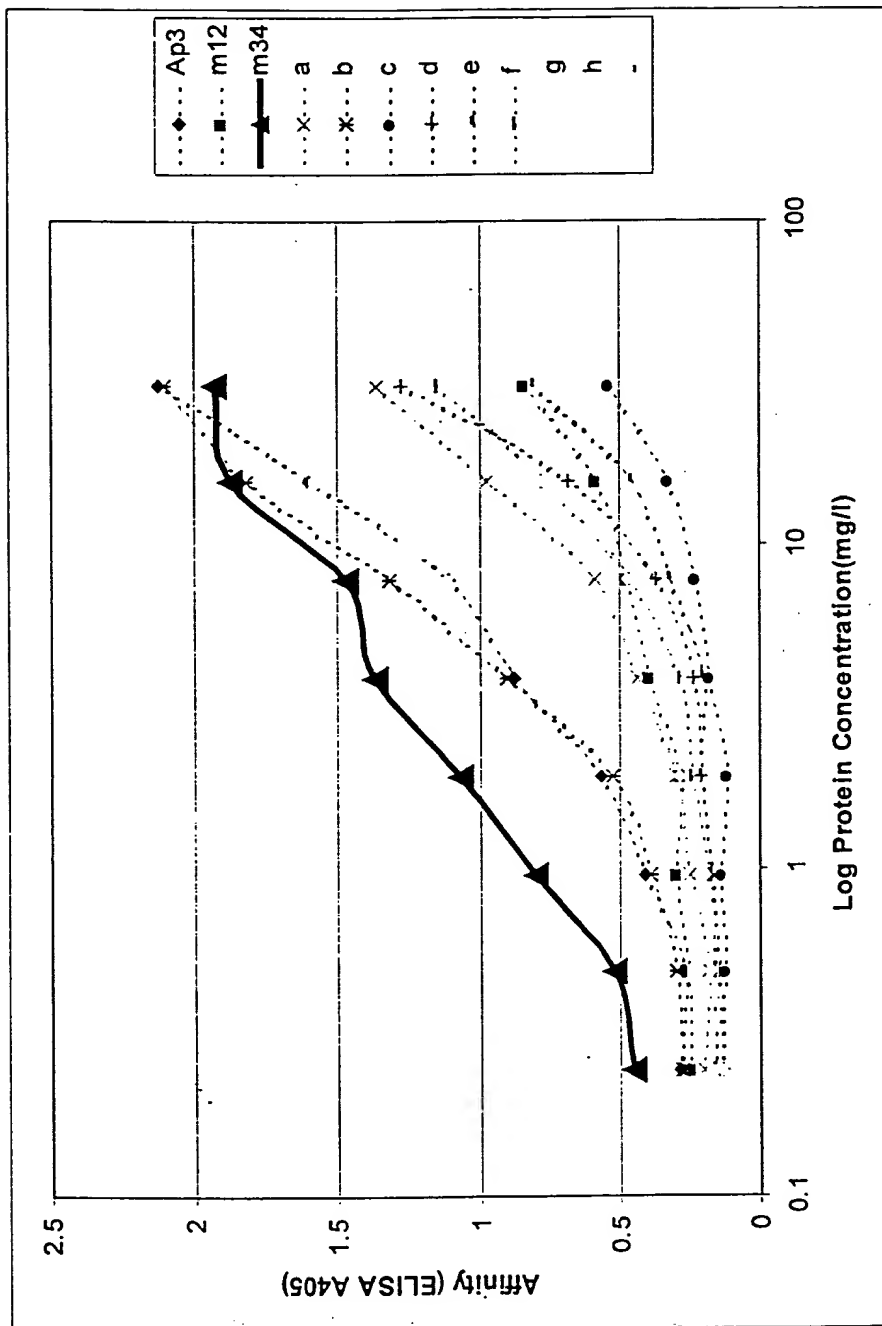


FIGURE 9

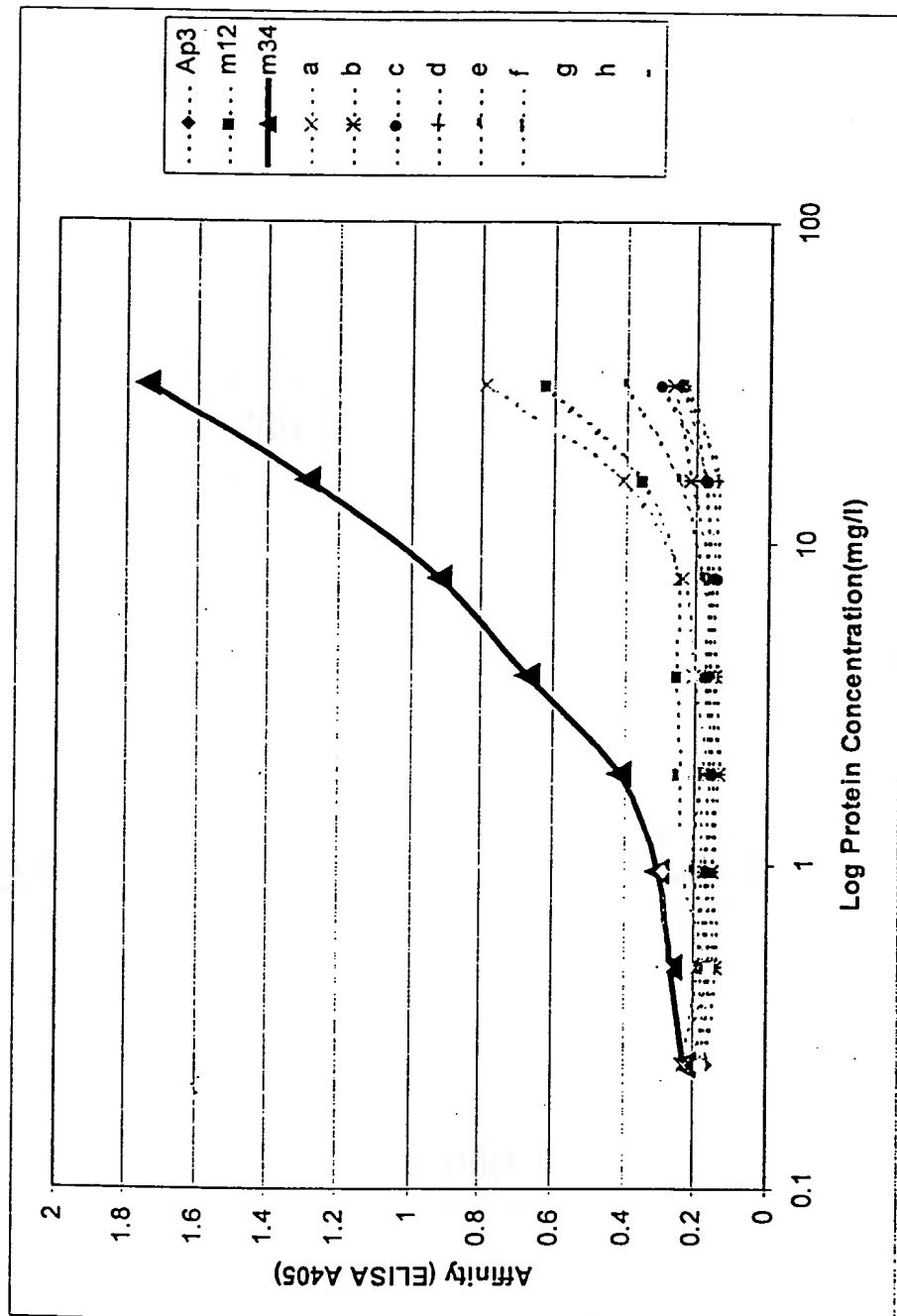


FIGURE 10

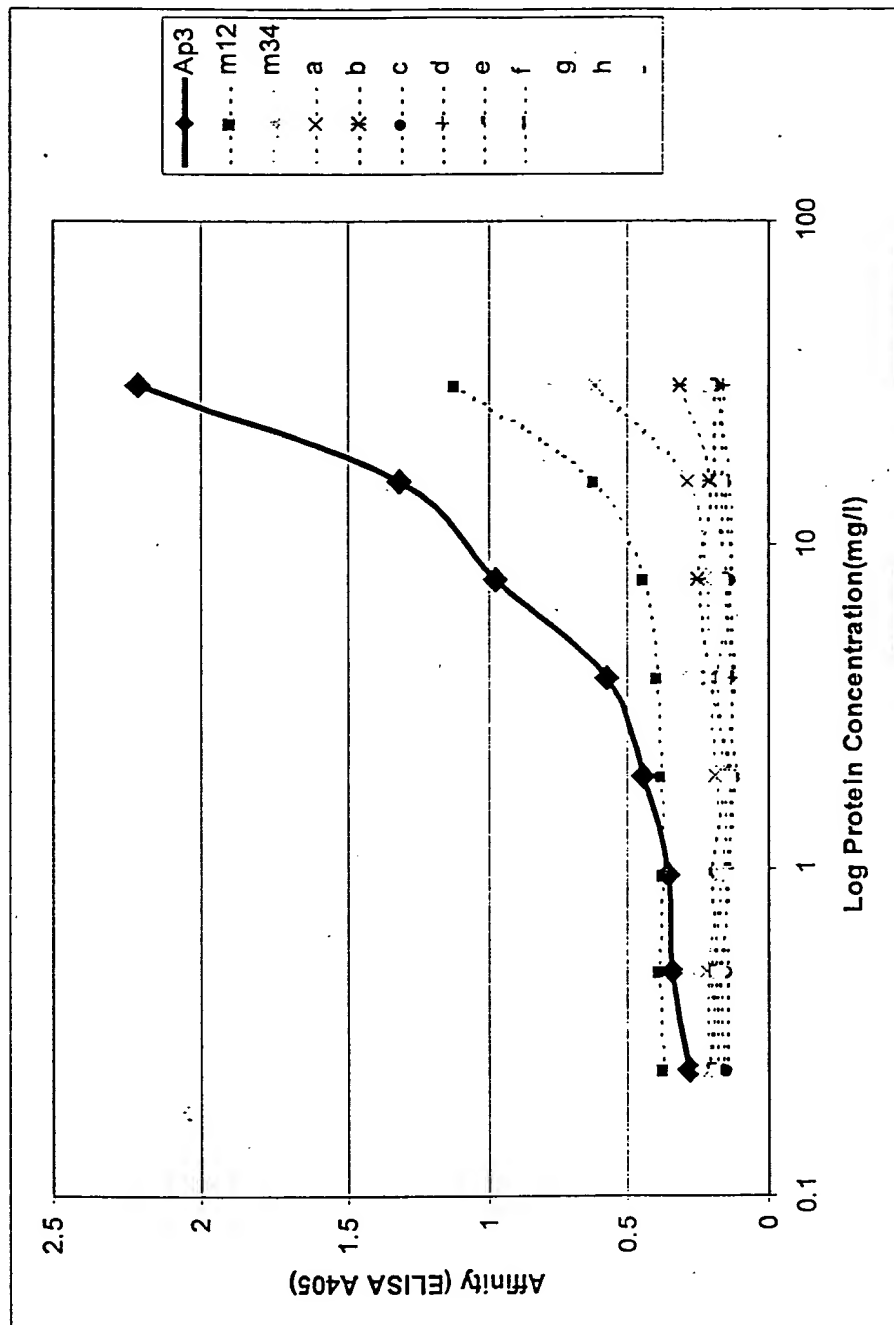


FIGURE 11

A



B

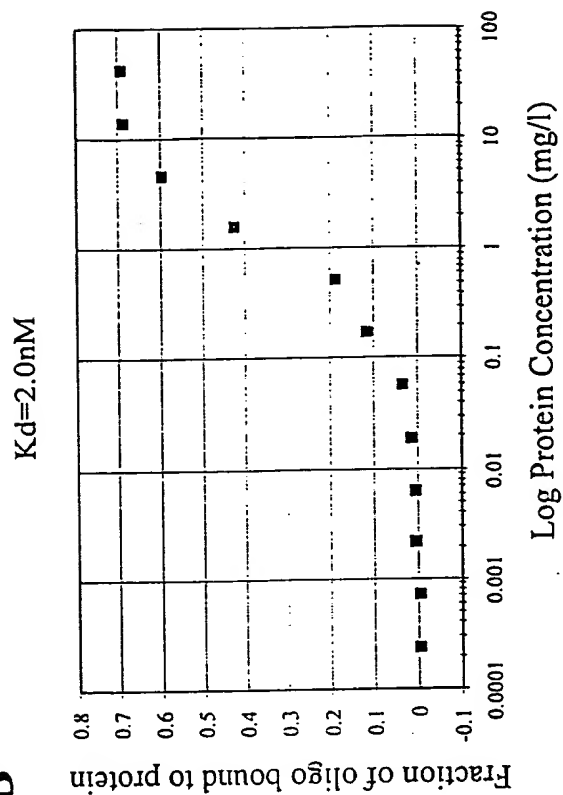


FIGURE 12

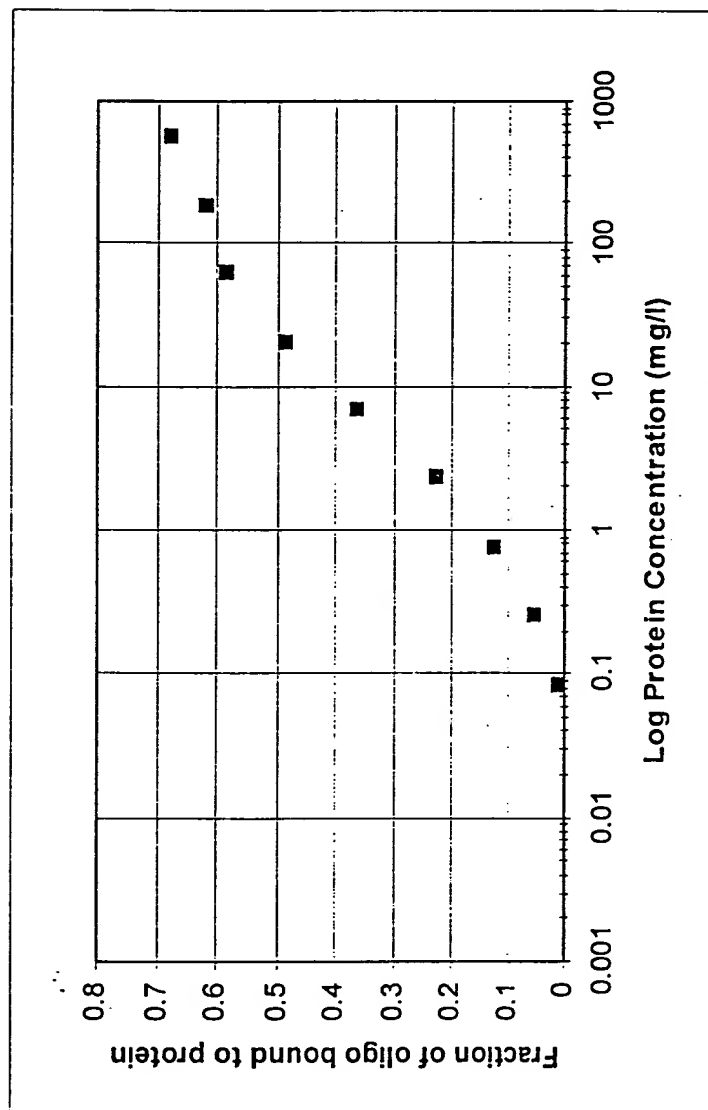


FIGURE 13

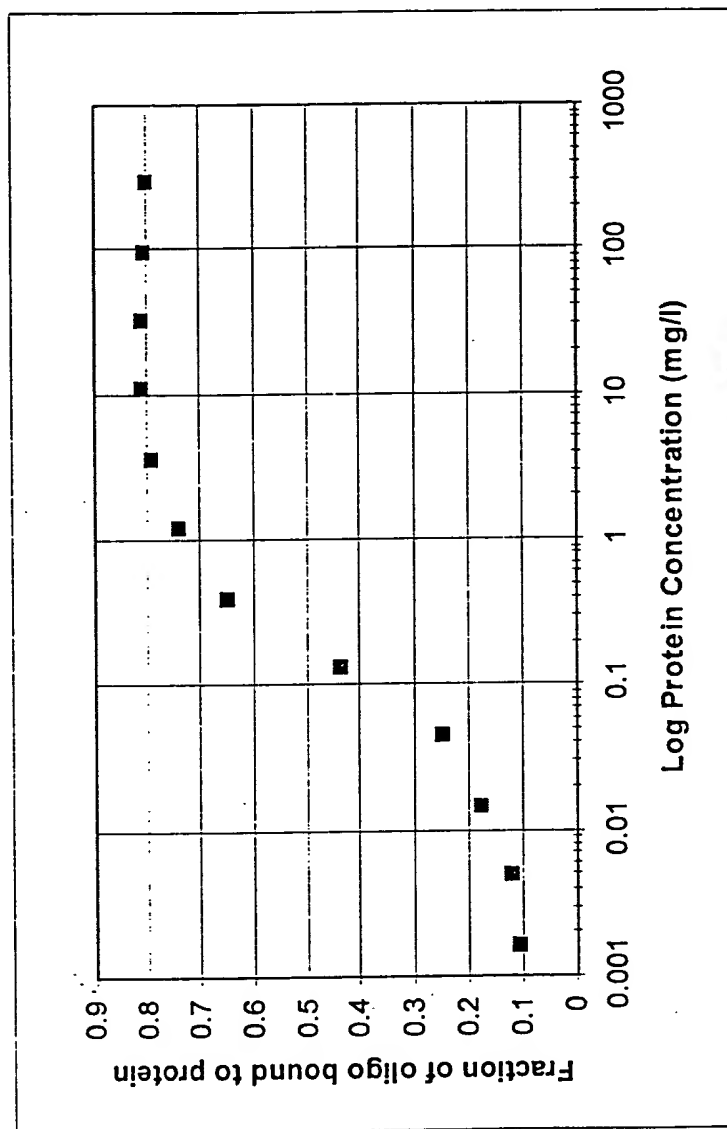


FIGURE 14

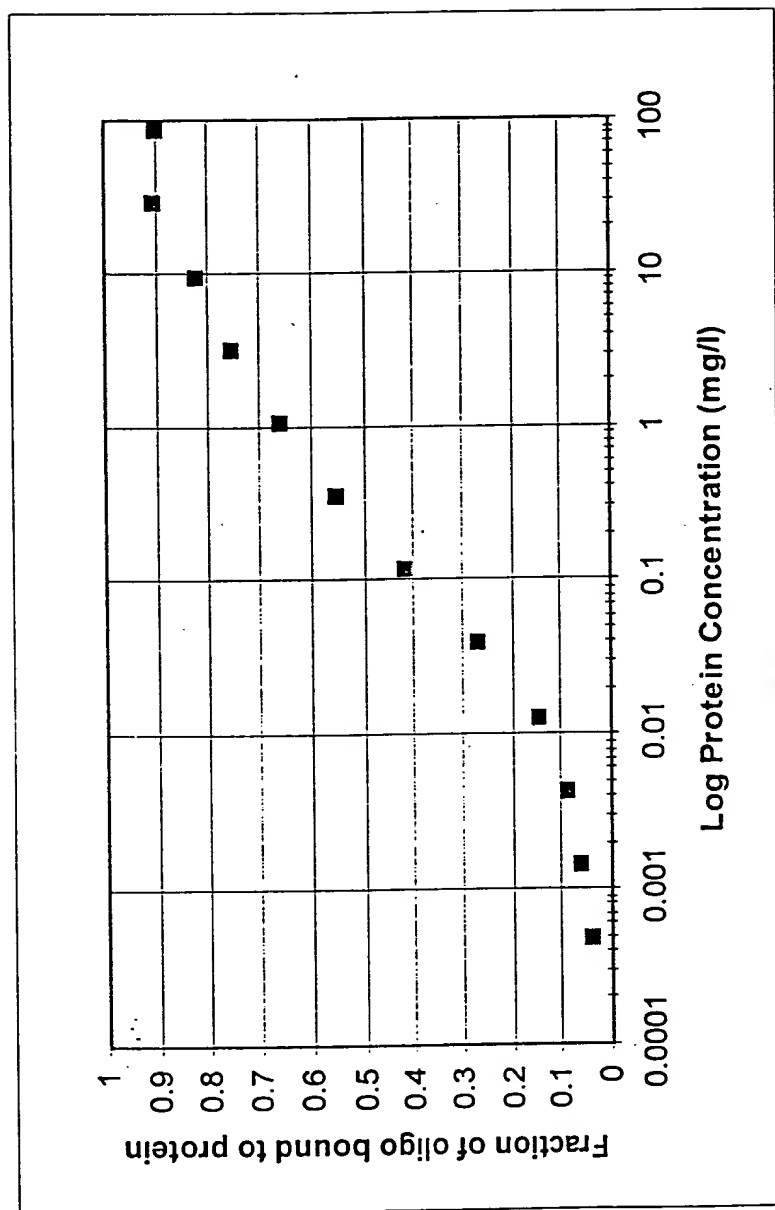


FIGURE 15

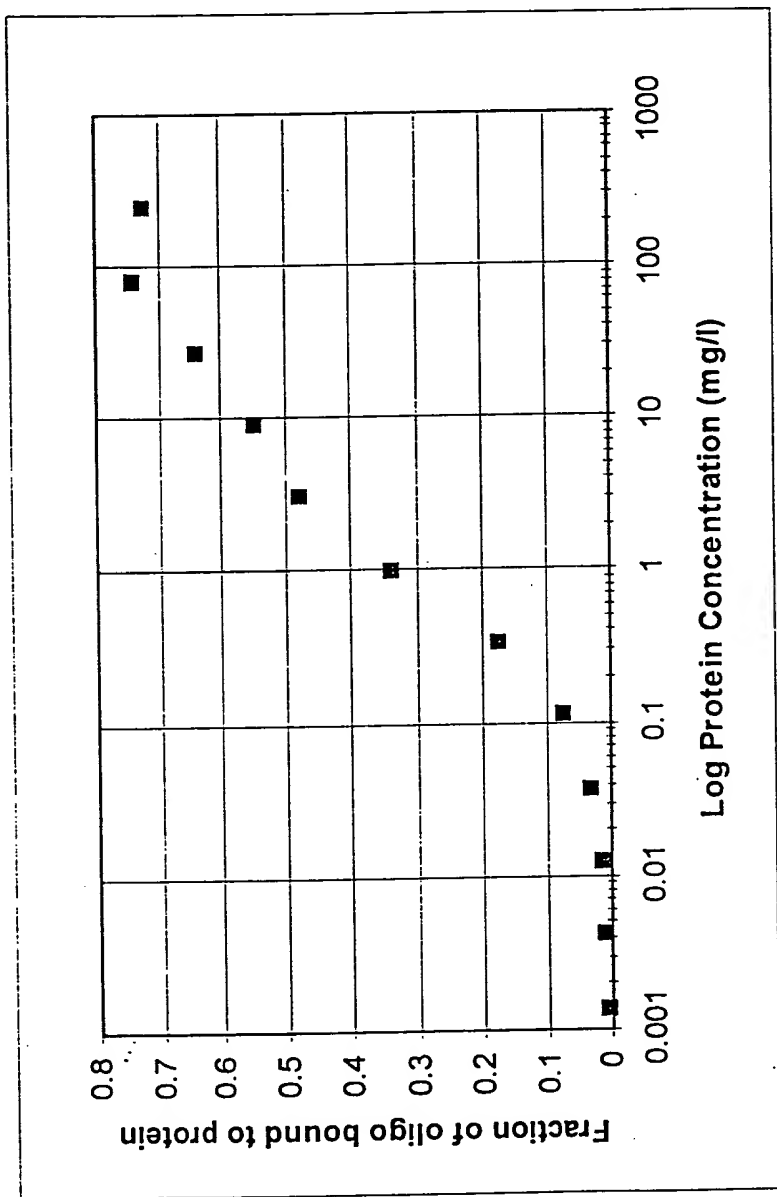


FIGURE 16



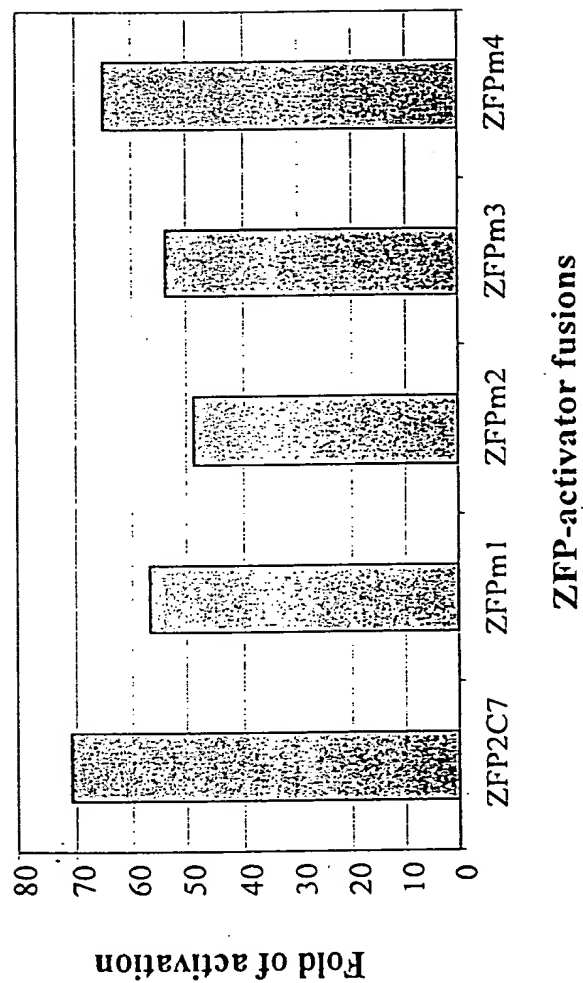
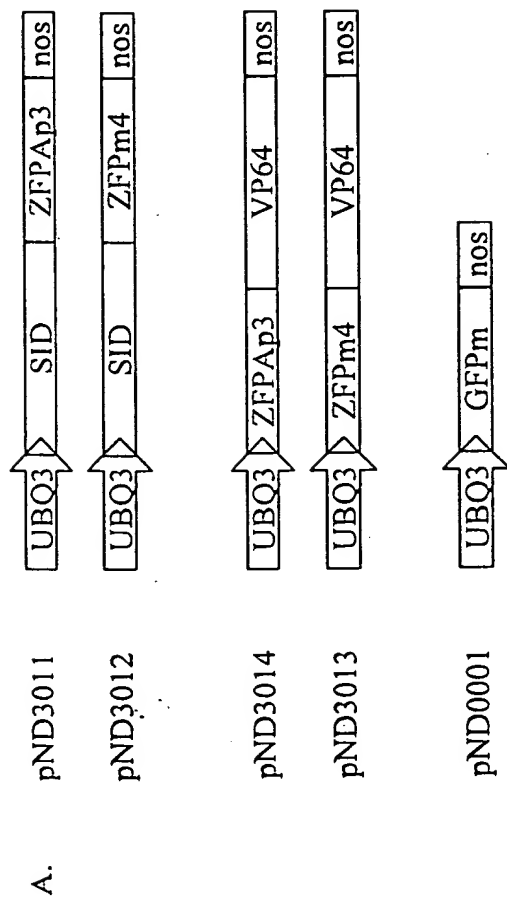


FIGURE 17

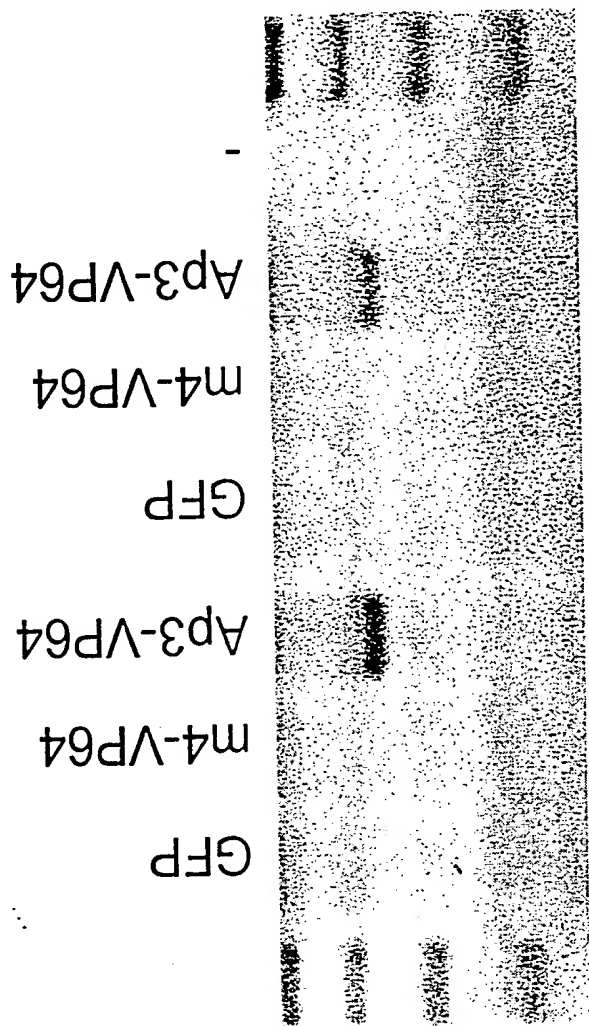


B.

|         |   |
|---------|---|
| pND0051 | pND3011 in plant transformation vector with Hygmicine as selection marker |
| pND0052 | pND3014 in plant transformation vector with Hygmicine as selection marker |

FIGURE 18

FIGURE 19



09765555.011901

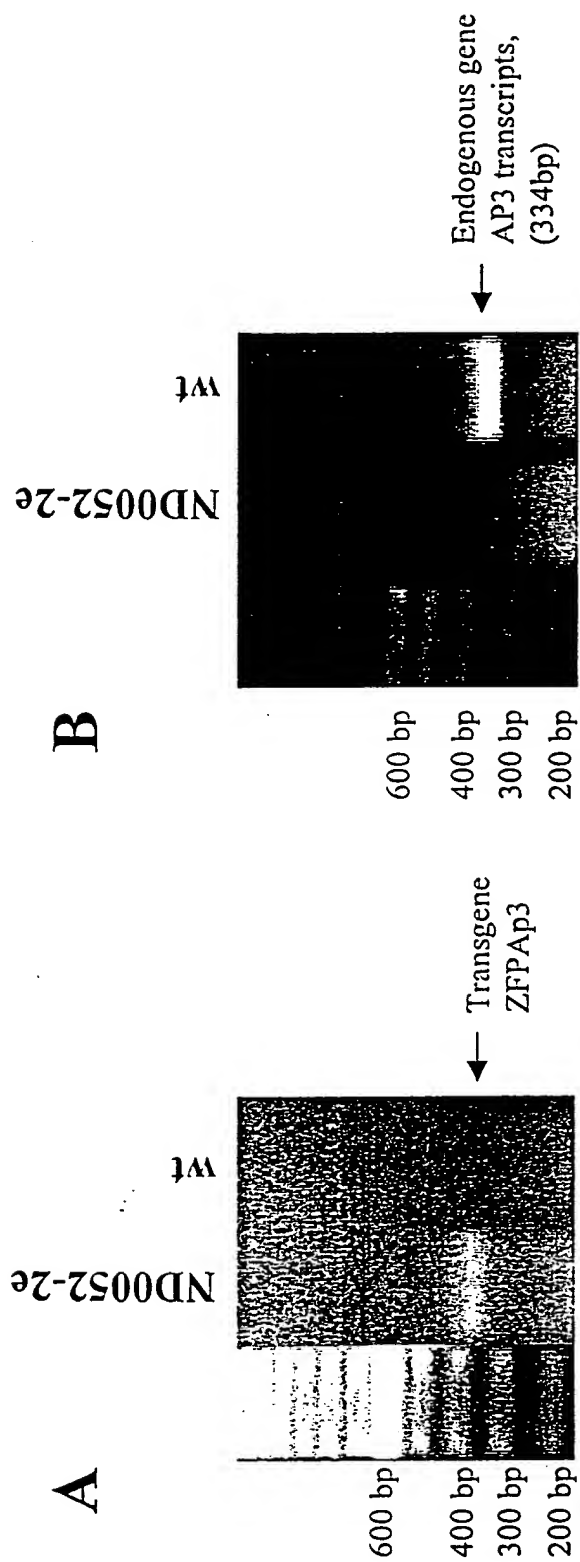


FIGURE 20

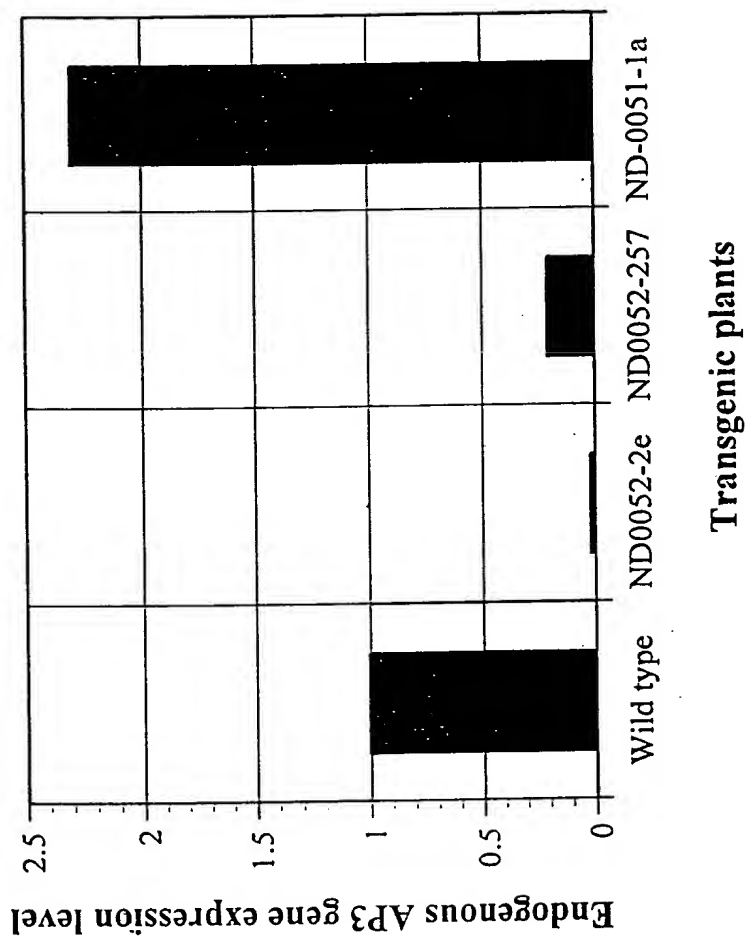


FIGURE 21

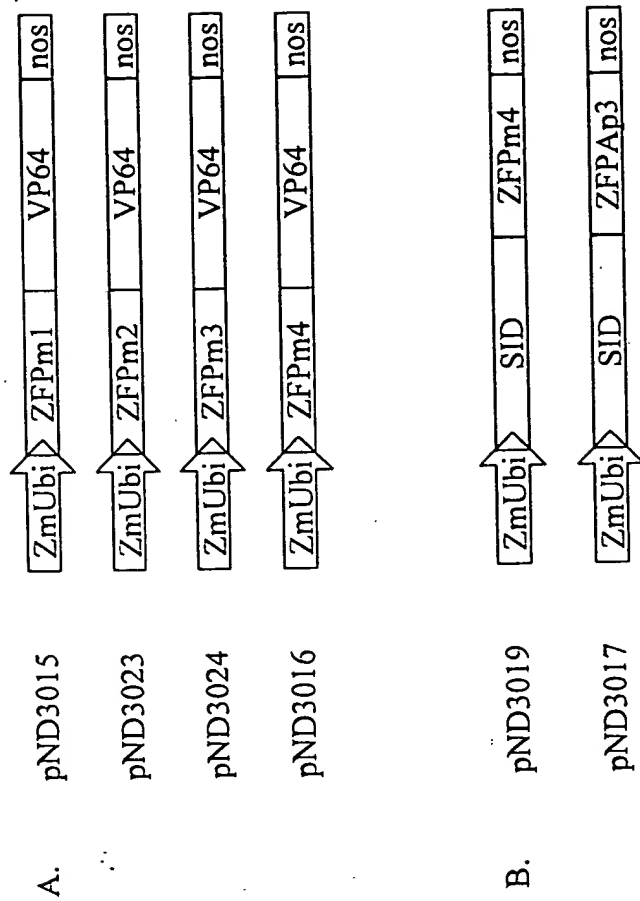


FIGURE 22

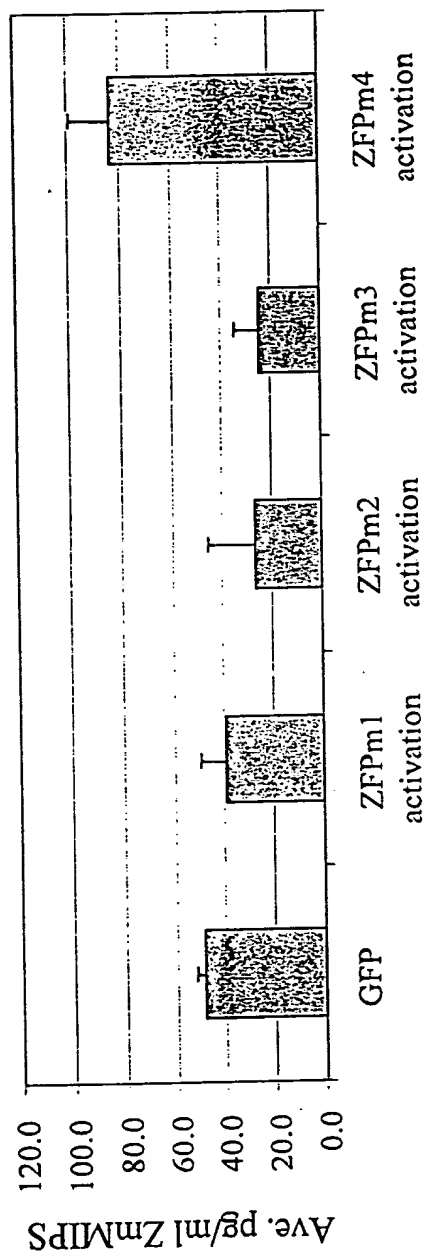


FIGURE 23

Figure 24

(1) Sequence of promoter CsVMV (Example 1A) (SEQ ID NO:1):

Tctagaaactagctccagaaggaattatccaagatgtagcatcaagaatccaatgtttacgggaaaaactatggaa  
gtattatgtgagctcagcaagaagcagatcaatatcgggcacatatgcaacctatgttcaaaaatgaagaatgtacagatacaag  
atcctatactgccagaatacgaagaagaatacgtagaattgaaaaagaagaaccaggcgaagaaaagaatcttgaagacgta  
agcactgacgacaacaatgaaaagaagaagataaggtcggtgattgtgaaagagacatagaggacacatgaaggtggaaaa  
tgaaggcggaagtaaccttatcacaaggaatcttatccccactacttatccttttatattttccgtgtcattttgcccttgagt  
ttcctataaaggaaccaagttcggcatttgtgaaaacaagaaaaatttggtgaagctattttcttgaagtactgaggatacaact  
tcagagaaatttgaagtttga

Total 531 bp

(2) Sequence of zinc finger protein 2C7 binding site (Example 1A) (SEQ ID NO:2):

GCG TGG GCG GCG TGG GCG

Total 18 bp.

(3) Sequence of promoter pc7rbTATA (Example 1A) (SEQ ID NO:3):

Cccgggtatataataagcttggcattccggtactgttggttaaagccacat

Total 51 bp.

(4) Sequence of pND3008 coding region (Example 1B) (SEQ ID NO:4):

agcgtgacccggctgtgccctctctagagataatgagcattgcatgtctaagttataaaaaattaccacatattttttg  
tcacactgtttgaagtgcagtttatctatctttatacatatatttaaactttactctacgaataatataatctatagtactacaataatca  
gtgttttagagaatcatataaatgaacagttagacatggctaaaggacaattgagtatttgacaacaggactctacagtttatcttt  
ttagtgtcatgtgttcctttttttgcaaatagcttcacctatataatacttcatccattttattagatccatttagggttagggtt  
aatggttttatagactaatttttttagtacatctattttattctatttttagcctctaaattaagaaaactaaaactctatttttagtttttatta  
ataatttagatataaaaataaataaaataaagtactaaaataaacaataaccctttaagaaattaaaaaactaaggaaacatttt  
tcttgtttcagtagataatgccagcctgttaaagcgcgtcgacgagctaacggacaccaaccagcgaaccagcagcgtcgcg  
tcgggccaagcgaagcagacggcagcgcgtctctgtcgtgcctctggacccctctcgagagttccgctccaccgttgacttg  
ctccgctgtcggcatccagaaattgcgtggcgggagcggcagacgtgagccggcagggcagggcctcctcctctcacg  
gcacggcagctacgggggattcctttccaccgctccttcgcttccctcctcgcggccgtaataaatagacacccctccaca



ccctctttccccaacctcgtgtgttcggagcgcacacacacaaccagatctccccc aaatccacccgtcggcacctccgctt  
caagggtacgccgctcgtccctccccccccccctctctaccttctctagatcggcgttccgggtccatggttagggcccggtagttc  
tactctgttcatgtttgtgtagatccgtgtttgtgtagatccgtgctgtagcgttcgtacacggatcgacctgtacgtcagacac  
gttctgattgctaacttgccagtgtttctcttggggaatcctgggatggctctagccgttccgcagacgggatcgatttcatgatttt  
tttgttctgtgcatagggttgggttggcccttttcttatttcaatatatgccgtgcacttgtttgtcgggtcatcttttcatgctttttgt  
cttgggtgtgatgatgtggtctggttggcggtcgttctagatcggagtagaattctgtttcaaactacctggtggattlattaatttgg  
atctgtatgtgtgtccatacatattcatagttacgaattgaagatgatggatggaaatcgcgatctaggataggtatacatgttgatg  
cgggttttactgatgcataacagagatgcttttgttcgcttgggtgtgatgatgtggtgtggttggcggtcgttcattcgttctagat  
cggagtagaataactgtttcaaactacctggtgtatttattaattttggaactgtatgtgtgtgcatacatcttcatagttacgagtttaag  
atggatggaaatcgcgatctaggataggtatacatgttgatgtgggttttactgatgcatacatgatggcatatgcagcatctattc  
atatgtcttaaccttgagtacatctattataataaacaagtatgtttataattttgatcttgatatacttggatgatggcatatgca  
gcagctatatgtggatttttttagccctgccttcatacgtatttatttgccttggactgttcttttgcgatgctcaccctgttgtttggtgt  
tacttctgcaggctcactctagaggatctatggcccaggcggccctcgagctccctatgcttgcctgtcgagtcctgcgatcgc  
cgcttttctaagtcggctgatctgaagcgccataccgcacccacacaggccagaagcccttccagtgtcgaatatgcatgcgtaa  
cttcagtcgtagtgaccaccttaccacccacatccgcacccacacaggcgagaagccctttgcctgtgacatttgtgggaggaag  
tttccaggagtgtgaacgcaagaggcatacaaaaatccataccgggtgagaagccctatgcttgcctgtcgagtcctgcgatc  
gccgcttttctaagtcggctgatctgaagcgccataccgcacccacacaggccagaagcccttccagtgtcgaatatgcatgcgt  
aacttcagtcgtagtgaccaccttaccacccacatccgcacccacacaggcgagaagccctttgcctgtgacatttgtgggagga  
agtttccaggagtgtgaacgcaagaggcatacaaaaatccatttaagacagaaggactctagaacttagggccaggccggc  
caggctagcccga aaaagaaacgcaaagtggggcgccgacgcgctggacgatttcgatctcgacatgctgggttctgatgc  
cctcgtatgactttgacctggatatgttgggaagcgacgcattggatgactttgatctggacatgctcggctccgatgctctggacg  
atttcgatctcgatatgttaattaactacctgacgacgttccggactacgcttcttgagaattcgcggccgcgggcccgcagcctag  
ggaggagctcaagatccccgaattccccgatcgttcaaacatttggcaataaagtcttaagattgaatcctgttgcggtcttgc  
cgatgattatcatctaatttctgttgaattacgttaagcatgtaataattaacatgtaatgcatgacgttatttatgagatgggttttatga  
ttagagtcccgcaattatacatttaatacgcgatagaaaacaaaatatagcgcgcaaactaggataaattatcgcgcgcgggtgtca  
tctatgttactagatccgggaattgggtac

|                              |                    |
|------------------------------|--------------------|
| Total:                       | 3120 bp            |
| ZmUbi promoter:              | 44 bp to 2026 bp   |
| Six finger ZFP2C7:           | 2060 bp to 2588 bp |
| Nuclear localization signal: | 2620 bp to 2641 bp |
| VP64 activation domain:      | 2641 bp to 2805 bp |

HA eptitope tag:

2805 bp to 2836 bp

Nos terminator:

2884 bp to 3164 bp

(5) Sequence of pND3018 coding region (Example 1B) (SEQ ID NO:5):

agcgtgacccggctcgtgccctctctagagataatgagcattgcatgtctaagttataaaaaattaccacatattttttg  
tcacacttggttgaagtgcagtttatctatctttatacatatatttaaactttactctacgaataatataatctatagtactacaataatca  
gtgttttagagaatcatataaatgaacagtttagacatggctctaaaggacaattgagtattttgacaacaggactctacagtttatcttt  
ttagtgtgcatgtgttctcctttttttgcaaatagcttcacatatataatacttcatccattttattagtacatccatttagggtttaggggt  
aatggttttatagactaatttttttagtacatctattttattctatttttagcctctaaattaagaaaactaaaactctattttagttttttat  
ataatttagatataaaatagaataaaataaagtactaaaaataaacaataaccctttaagaaataaaaaactaaggaaacatttt  
tctgtttcagtagataatgccagcctgttaaacgccgtcgacgagctaacggacaccaaccagcgaaccagcagcgtcgcg  
tcgggccaagcgaagcagacggcagggcatctctgtcgtgcctctggaccctctcgagagttccgctccaccgttgacttg  
ctccgctgtcggcatccagaaattgcgtggcggagcggcagacgtgagccggcagggcagggcctcctcctctcacg  
gcacggcagctacgggggattcctttcccaccgctccttcgctttccctcctcgcccgccgtaataaatagacacccctccaca  
ccctctttcccaacctcgtgttgctggagcgcacacacacaaccagatctccccaatccaccgctggcacctccgctt  
caaggtagccgctcgtcctccccccccccccctctctaccttctctagatcggcgttccgggtccatggttagggcccggtagtgc  
tacttctgttcatgtttgtgtagatccgtgttgtagatccgtgctgtagcgttcgtacacggatgcgacctgtacgtcagacac  
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atctgtatgtgtgtccatacatattcatagttacgaattgaagatgatggatggaaatcgcgtctagtaggtatagatgttgatg  
cgggttttactgatcatatacagagatgctttttgttcgcttggttgatgatgtggtgtggttggcggtcgttcattcgttctagat  
cggagtagaatactgtttcaaactacctggtgtatttattaattttggaactgtatgtgtgtgcatacatcttcatagttacgagtttaag  
atggatggaaatcgcgtctagtaggtatagatgttgatgtgggttttactgatgcatacatatgatggcatatgcagcatctattc  
atatgctctaaccttgagtacctatctattataataaacaagtatgtttataatttttgatcttgataacttgatgatggcatatgca  
gcagctatatgtggatttttttagccctgccttcatacgcctatttttggcttggtactgtttctttgtcgtatgctcacctgttgttgggtg  
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aaacgcaaggtggcccaggcggccctcgagctcccctatgcttgcctgtcagtcctgcgatcggcgttttctaagtcggctg  
atctgaagcgcataatccgcattccacacaggccagaagcccttccagtgctgaatatgcatgcgtaacttcagtcgtagtacca  
ccttaccacccacatccgcacccacacaggcgagaagccttttgcctgtgacatttggggagggaagtttgcaggagtgatgaa

cgcaagaggcataccaaaatccataccggtgagaagccctatgcttgcctgtcgagtcctgcgatgccgcttttctaagtcgg  
 ctgatctgaagcgccatatccgcatccacacaggccagaagcccttccagtgtcgaatatgcatgcgtaacttcagtcgtagtga  
 ccaccttaccaccacatccgcacccacacaggcgagaagccctttgcctgtgacatttggggaggaagttgccaggagtgat  
 gaacgcaagaggcataccaaaatccatttaagacagaaggactctagaactagtggccaggccggccagtacctgtacgacg  
 ttccggactacgcttcttgaagccttggtaccgagctcggatccccgaattccccgatcgttcaaacatttggaataaagttctt  
 aagattgaatcctgttgcggcttgcgatgattatcatctaatttctgttgaattacgttaagcatgtaataattaacatgtaatgatg  
 acgttatttatgagatgggtttttatgattagagtcgccgaattatacatttaatacgcgatagaaaacaaaatatagcgcgcaacta  
 ggataaattatcgcgcgcggtgtcatctatgttactagatccgggaattccggaccggtaccagcggcc

|                              |                    |
|------------------------------|--------------------|
| Total:                       | 3068 bp            |
| ZmUbi promoter:              | 44 bp to 2026 bp   |
| SID repression domain:       | 2066 bp to 2173 bp |
| Nuclear localization signal: | 2174 bp to 2194 bp |
| Six finger ZFP2C7:           | 2207 bp to 2735 bp |
| HA epitope tag:              | 2762 bp to 2791 bp |
| Nos terminator:              | 2820 bp to 3112 bp |

(6) Sequence of 6X2C7 binding site (SEQ ID NO:6):

Cgtgctagcgcgtggcgggcgtgggcgaacaagcgtggcgggcgtgggcgaacaagcgtggcgggcgtgggc  
 gactagtgtgtagcgcgtggcgggcgtgggcgaacaagcgtggcgggcgtgggcgaacaagcgtggcgggcgtgggcgac  
 tagtg

Total: 155 bp

(7) Sequence of 3 finger protein C7:

Atggcccaggcggccctcgagccctatgcttgcctgtcgagtcctgcgatgccgcttttctaagtcggctgatctg  
 aagcgccatatccgcatccacacaggccagaagcccttccagtgtcgaatatgcatgcgtaacttcagtcgtagtaccacctta  
 ccaccacatccgcacccacacaggcgagaagccctttgcctgtgacatttggggaggaagttgccaggagtgtgaacgca  
 agaggcataccaaaatccatttaagacagaaggactctagaactagtggccaggccggccaggctagc

Total: 314 bp

(8) Amino acid sequence of 3 finger protein C7:

Maqaalepyacpvescdrrfsksadlkrhirihtgqkpfqcrimmmfsrsdhlthirthtgekpfacdicgrkfar  
sderkrhtkihlrqkdsrtsgqagqas

Total: 105 aa

(9) Sequence of zinc finger protein ZFPap3 binding site:

GAT GGA GTT GAA GAA GTA

Total: 18 bp

(10) Sequence of zinc finger protein ZFPm1 and ZFPm2 binding site m12:

GCC TCC TTC CTC CTC TCA CTC

Total: 21 bp

ZFPm1 binding site: compliment strand of 1 to 18

ZFPm2 binding site: compliment strand of 4 to 21

(11) Sequence of zinc finger protein ZFPm3 and ZFPm4 binding site m34:

GCC AAC TAC TAC GGC TCC CTC ACC

Total: 21 bp

ZFPm3 binding site: compliment strand of 1 to 18

ZFPm4 binding site: compliment strand of 7 to 24

(12) Partial sequence of pMal-m1 (1-3300 bp) and zinc finger protein ZFPm1

(2719-3270 bp) (SEQ ID NO:14):

ccgacaccatcgaatgggtgcaaaaccttgcgggtatggcatgatagcgcccggaagagagtcaattcagggtgtg  
gaatgtgaaaccagtaacgttatacgatgtcgcagagtatgccggtgtcttatcagaccgttcccgcgtggtgaaccaggcca  
gccacgtttctgcgaaaacgcgggaaaaagtgaagcggcgatggcggagctgaattacattccaaccgcgtggcacaaca  
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0976555-041904

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gtggaattgtgagcgggataacaatttcacacaggaaacagccagtcggttaggtgtttcacgagcacttcaccaacaaggacc  
atagattatgaaaactgaagaaggtaaactggtaatctggattaacggcgataaaggctataacgggtctcgtgaagtcggtaag  
aaattcgagaaagataccggaattaaagtcaccgttgagcatccggataaactggaagagaaattccacaggttgcggcaact  
ggcgatggccctgacattatcttctgggcacacgaccgcttgggtggctacgctcaatctggcctgttggctgaaatcaccccg  
acaaagcgtccaggacaagctgtatccgttacctgggatgccgtactgtacaacggcaagctgattgcttaccgatcgtggt  
gaagcgttatcgtgattataacaaagatctgctgccgaaccggccaaaaacctgggaagagatccggcgctggataaagaa  
ctgaaagcgaaaggtgaagcgcgctgatgtcaacctgcaagaaccgtacttcacctggccgctgattgctgctgacgggggt  
tatgcgtcaagtatgaaaacggcaagtacgacattaaagacgtgggcgtggataacgctggcgcgaaagcgggtctgaccttc  
ctggttgacctgattaaaaacaacacatgaatgcagacaccgattactccatcgagaagctgcctttaataaaggcgaaacag  
cgatgaccatcaacggcccgtgggcatggtccaacatcgacaccagcaaatgaattatggtgtaacggtagtcccaccttca  
agggtcaaccatccaaaccgttcgttggcgtgctgagcgcaggtattaacgccgagtcggaacaaagagctggcaaaaga  
gttcctcgaaaactatctgctgactgatgaaggtctggaagcgggttaataaagacaaaccgtgggtgccgtagcgtgaagctt  
tacgaggaagagttggcgaaagatccacgtattgccgccaccatggaaaacgccagaaaggtgaaatcatgccgaacatcc  
cgcatgtccgcttctggtatgccgtgcgtactgcgggtgatcaacgccgccagcggctgctcagactgtcgtgaagccctga  
aagacgcgcagactaatcgagctgaacaacaacaataacaataacaacacctcgggatcgagggaaggatttcagaa  
ttcggtacctcttctctgtggccaggcggccctcgagccggggagaagccctatgcttgcgggaatgtggtlaagtccttctc  
tcagagctctcacctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatcttttag  
ccagtcagcaacctggtgcgccatcaacgcactcactggtgcgagaagccatacaaatgtccagaatgtggcaagtcttctct  
cggcttgacaatctcgtccggcaccaacgtactcacaccggggagaagccctatgcttgcgggaatgtggtlaagtccttcagcc  
gcagcgataacctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatcttttagc  
caggccggccacctggccagccatcaacgcactcactggtgcgagaagccatacaaatgtccagaatgtggcaagtcttctct  
cggcttgacaatctcgtccggcaccaacgtactcacaccggtaaaaaactagtggccaggccggccagtagccgtacgacgt  
tccggactacgct

Total: 514 bp

Primer F1-f1 of ZFPm1: 2770 bp to 2850 bp

Primer F1-f2 of ZFPm1: 2740 bp to 2790 bp

Primer F2-f of ZFPm1: 2867 bp to 2940 bp

Primer F2-b of ZFPm1: 2824 bp to 2889 bp

Primer F3-b1 ZFPm1: 2916 bp to 2973 bp

Primer F3-b2 ZFPm1: 2953 bp to 3021 bp

Primer F4-f1 of ZFPm1: 3022 bp to 3102 bp

Primer F4-f2 of ZFPm1: 2992 bp to 3042 bp

Primer F5-f of ZFPm1: 3119 bp to 3192 bp

Primer F5-b of ZFPm1: 3076 bp to 3141 bp

Primer F6-b1 of ZFPm1: 3168 bp to 3225 bp

Primer F6-b2 of ZFPm1: 3205 bp to 3273 bp

(13) Sequence of zinc finger protein ZFPm1

(Translated from pMal-m1: 2719-3270 bp):

Aqaalepgekyacpecgksfsdpghlvhrhqrthtgekykpecgksfsqrahlerhqrthtgekykpec  
gksfsqssnlvrhqrthtgekyacpecgksfsrsdnlvrhqrthtgekykpecgksfsrsdnlvrhqrthtgekykpe  
cgksfsqaghlashqrthtgkktsgqag

(14) Partial sequence of pMal-m2 (1-3300 bp) and zinc finger protein ZFPm2

(2719-3270 bp) (SEQ ID NO:15):

ccgacaccatcgaatggtgcaaaacctttcgcggtatggcatgatagcgcccggaagagagtaattcagggtggt  
gaatgtgaaaccagtaacgttatacgaatgctgcagagtatgccggtgtctcttatcagaccgtttcccgctggtgaaccaggcca  
gccacgtttctgcgaaaacgcgggaaaaagtgaagcggcgatggcggagctgaattacattccaaccgcgtggcacaaca  
actggcgggcaaacagtcgttgctgattggcggtgccacctcagctctggcctgcacgcgccgtcgcaaatgtcgcggcgat  
taaactcgcgccgatcaactgggtgccagcgtggtggtgctgatggtagaacgaagcggcgctgaagcctgtaaagcggcg  
gtgcacaatcttctcgcgaacgcgtcagtggtgatcattaactatccgctggatgaccaggatgccattgctgtggaagctg  
cctgcactaatgttcggcggtatttcttgatgtctctgaccagacacccatcaacagtatttttctccatgaagacgggtacgcga  
ctggcggtggagcatctggtcgcattgggtcaccagcaaatcgcgctgtagcgggcccattaagtctgtctcggcgctctgc



cggtctgacaatctcgccggcaccaacgtactcacaccggtaaaaaactagtgccaggccggccagtagccgtacgacgt  
tccggactacgct

Total: 514 bp

Primer F1-f1 of ZFPm2: 2770 bp to 2850 bp

Primer F1-f2 of ZFP m2: 2740 bp to 2790 bp

Primer F2-f of ZFP m2: 2867 bp to 2940 bp

Primer F2-b of ZFPm2: 2824 bp to 2889 bp

Primer F3-b1 ZFPm2: 2916 bp to 2973 bp

Primer F3-b2 ZFPm2: 2953 bp to 3021 bp

Primer F4-f1 of ZFPm2: 3022 bp to 3102 bp

Primer F4-f2 of ZFPm2: 2992 bp to 3042 bp

Primer F5-f of ZFPm2: 3119 bp to 3192 bp

Primer F5-b of ZFPm2: 3076 bp to 3141 bp

Primer F6-b1 of ZFPm2: 3168 bp to 3225 bp

Primer F6-b2 of ZFPm2: 3205 bp to 3273 bp

(15) Partial sequence of pMal-m3 (1-3300 bp) and zinc finger protein ZFPm3

(2719-3270 bp) (SEQ ID NO:16):

ccgacaccatcgaatgggtgcaaaacctttcgcggtatggcatgatagcgcccggaagagagtcaattcagggtggt  
gaatgtgaaaccagtaacgttatacgtatgctgcagagtatgccggtgtctcttatcagaccgtttcccgctggtgaaccaggcca  
gccacgtttctgcgaaaacgcgggaaaaagtgaagcggcgatggcggagctgaattacattccaaccgcgtggcacaaca  
actggcgggcaaacagtcgttgctgattggcgttgccacctcagctctggccctgcacgcgccgtcgcaattgtcgcggcgat  
taaattctcgcgccgatcaactgggtgccagcgtggtggtgctgatgtagaacgaagcggcgtcgaagcctgtaaagcggcg  
gtgcacaattctctcgcgaacgcgtcagtggtgatcattaactatccgtggatgaccaggatgccattgctgtggaagctg  
cctgcactaatgttccggcgttatttctgatgtctctgaccagacacctcaacagtatttttctccatgaagacggtacgga  
ctgggcgtggagcatctggtcgcattgggtcaccagcaaatcgcgtgtagcgggccattaagtctgtctcggcgcgtctgc  
gtctggtggtggcgtgataaatatctcactcgcaatcaaattcagccgatagcggaaacgggaaggcgactggagtgcattgtccg  
gttttcaaaaaccatgcaaatgctgaatgagggcatcgttccactcgcgatgctggttccaacgatcagatggcgtggggcgc  
aatgcgcgccattaccgagtcggggtgcgcgttggtgcggatatctcgtagtgggatacgacgataccgaagacagctcat  
gttatatcccgccgttaaccacatcaaacaggattttcgcctgctggggcaaacaccagcgtggaccgctgctgcaactctctcag



0955260  
F06T01691

ggccaggcgggaagggcaatcagctgttcccgtctactggtgaaaagaaaaaccacctggcgcccaatacgcaaaccg  
cctctccccgcggttggccgattcattaatgcagctggcacgacaggttcccactggaaagcgggcagtgagcgcaacgc  
aattaatgtgagtttagctcactcattaggcacaattctcatgttgacagcttatcatcgactgcacgggtgcaccaatgcttctggcgt  
caggcagccatcggaagctgtggtatggctgtgcaggtcgtaaatcactgcataatcgtgtcgtcaaggcgcactcccgttct  
ggataatgtttttgcgccgacatcataacggttctggcaaatattctgaaatgagctgttgacaattaatcatcggtcgtataatgt  
gtggaattgtgagcggataacaatttcacacaggaaacagccagtcctgttaggtgtttcacgagcacttcaccaacaaggacc  
atagattatgaaaactgaagaaggtaaactggtaactctggattaacggcgataaaggctataacggctctcgtgaagtcggtaag  
aaattcgagaaaataaccggaattaaagtcaccgttgagcatccggataaactggaagagaaattccacaggttgcggcaact  
ggcgatggccctgacattatcttctgggcacacgaccgctttgggtggctacgtcaatctggcctgttggtgaaatcaccccg  
acaaagcgttccaggacaagctgtatccgtttacctgggatgccgtacgttacaacggcaagctgattgcttaccgatcgtgtt  
gaagcgttatcgctgattataacaaagatctgctgccgaacccgcaaaaacctgggaagagatccggcgctggataaagaa  
ctgaaagcgaaaggtaagagcgcgctgatgttcaacctgcaagaaccgtacttcacctggccgctgattgctgctgacgggggt  
tatgcgttcaagtatgaaaacggcaagtacgacattaagacgtgggcgtggataacgctggcgcgaaagcgggtctgaccttc  
ctggttgacctgattaaaaacacacatgaatgcagacaccgattactccatcgagaagctgcccttaataaaggcgaaacag  
cgatgaccatcaacggcccggtggcatgttccaacatcgacaccagcaaagtgaattatggtgtaacggtactgccgacctca  
agggtcaaccatccaaaccgttctgtggcgtgctgagcgcaggtattaacgccgccagtcggaacaaagagctggcaaaaga  
gttctctgaaaactatctgctgactgatgaaggtctggaagcggtaataaagacaaaccgctgggtgccgtagcgctgaagtct  
tacgaggaagagttggcgaaagatccacgtattgccgccaccatggaaaacgccagaaagggtgaatcatgccgaacatcc  
cgcagatgtccgcttctgttatgccgtgctactgcggtgatcaacgccgccagcggtcgtcagactgtcgtatgaagccctga  
aagacgcgcagactaattcgagctcgaacaacaacaataacaataacaacacctgggatcgagggaaggatttcagaa  
ttcgatcctcttctctgtggcccaggcggccctcgagcccggggagaagccctatgcttgcgggaatgtggttaagtccttca  
gcgatcctggccacctggttcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatctttta  
gcaccagcgggtccctggtgcgccatcaacgcactcactggcgagaagccatacaaatgtccagaatgtggcaagcttttca  
gccagagctccagcctggtgcgccaccaacgtactcacaccggggagaagccctatgcttgcgggaatgtggttaagtccttca  
gccagagcagctccctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatctttt  
agtactgccgcgaccttgcctcatcaacgcactcactggcgagaagccatacaaatgtccagaatgtggcaagctttct  
cccaatccagccatctcgtccggcaccaacgtactcacaccggtaaaaaactagtgccaggccggccagtagccgtacgac  
gttccggactacgct

Total: 514 bp

Primer F1-f1 of ZFPm3: 2770 bp to 2850 bp

Primer F1-f2 of ZFP m3: 2740 bp to 2790 bp

Primer F2-f of ZFP m3: 2867 bp to 2940 bp

Primer F2-b of ZFPm3: 2824 bp to 2889 bp

Primer F3-b1 ZFPm3: 2916 bp to 2973 bp

Primer F3-b2 ZFPm3: 2953 bp to 3021 bp

Primer F4-f1 of ZFPm3: 3022 bp to 3102 bp

Primer F4-f2 of ZFPm3: 2992 bp to 3042 bp

Primer F5-f of ZFPm3: 3119 bp to 3192 bp

Primer F5-b of ZFPm3: 3076 bp to 3141 bp

Primer F6-b1 of ZFPm3: 3168 bp to 3225 bp

Primer F6-b2 of ZFPm3: 3205 bp to 3273 bp

(16) Partial sequence of pMal-m4 (1-3300 bp) and zinc finger protein ZFPm4  
(2719-3270 bp) (SEQ ID NO:17):

ccgacaccatcgaatggtgcaaacctttcgcggtatggcatgatagcgcccggaagagagtcaattcagggtggt  
gaatgtgaaaccagtaacgttatcatgatgtcgcagagtatgccggtgtctcttatcagaccgtttcccgctggtgaaccaggcca  
gccacgtttctgcgaaaacgcgggaaaaagtgaagcggcgatggcgggagctgaattacattccaaccgcgtggcacaaca  
actggcgggcaaacagtcgttgctgattggcgttgccacctcagctcgtgccctgcacgcgccgtcgcaattgtcgcggcgat  
taaattctgcgcgatcaactgggtgccagcgtgggtgtcgtatggtagaacgaagcggcgtcgaagcctgtaaagcggcg  
gtgcacaattctctcgcgcaacgcgtcagtggtgtgatcattaactatccgtggatgaccaggatgccattgctgtggaagctg  
cctgcactaatgttccggcgttatttctgatgtctctgaccagacacctcaacagtatttttctccatgaagacggtacgcga  
ctggcgctggagcatctggtcgcattgggtcaccagcaaatcgcgctgtagcggggccattaagtctgtctcggcgcgtctgc  
gtctggctggctggcataaatctcactcgaatcaaattcagccgatagcggaacgggaaggcgactggagtgccatgtccg  
gtttcaacaaaccatgcaaatgctgaatgagggcatcgttccactgcgatgctggttccaacgatcagatggcgtgggcgc  
aatgcgcgccattaccgagtccgggtgcgcgttggtgcggatatctcggtagtgggatacgacgataccgaagacagctcat  
gttatatcccgccgttaaccaccatcaaacaggattttcgcctgctggggcaaacagcgtggaccgttgctgcaactctctcag  
ggccaggcgtgaagggaatcagctgttgcctgtcactggtgaaaagaaaaaccacctggcgccaatacgcaaacg  
cctctccccgcgcttgccgattcattaatgcagctggcacgacaggttcccgactggaaagcgggcagtgagcgcaacgc  
aattaatgtgagttagctcactcattaggcacaattctcatgttgacagcttatcgcactgcacggtgcaccaatgcttctggcgt  
caggcagccatcggaaagctgtggtatggctgtgcaggtcgtaaatcactgcataattcgtgtcgtcgaaggcgcactcccgttct  
ggataatgtttttgcgccgacatcataacggttctggcaaatattctgaaatgagctgttgacaattaatcatcggtcgtataatgt

gtggaattgtgagcggataacaatttcacacaggaacagccagtcggttaggtgtttcacgagcattcaccaacaaggacc  
 atagattatgaaaactgaagaaggtaaactggtaattctggattaacggcgataaaggctataacggctcgcgtgaagtcggttaag  
 aaattcgagaaagataccggaattaaagtcaccgttgagcatccggataaactggaagagaaattcccacaggttgcggcaact  
 ggcgatggccctgacattatcttctgggcacacgaccgcttgggtggctacgctcaatctggcctgttggctgaaatcaccccg  
 acaaagcgttccaggacaagctgtatccgtttacctgggatgccgtacgttacaacggcaagctgattgcttaccgatcgtgtt  
 gaagcgttatcgtgattataacaagatctgctgccgaacccgcaaaaacctgggaagagatcccggcgtggataaagaa  
 ctgaaagcgaaaggtaagagcgcgctgatgttcaacctgcaagaaccgtacttcacctggccgctgattgctgctgacgggggt  
 tatgcttcaagatgaaaacggcaagtacgacattaaagacgtgggcgtggataacgctggcgcaagcgggtctgaccttc  
 ctggttgacctgattaaaaacaacacatgaatgcagacaccgattactccatcgagaagctgcctttaataaaggcgaaacag  
 cgatgaccatcaacggcccggtggcatggtccaacatcgacaccagcaaagtgaattatggtgtaacgggtactgccgacctca  
 agggtaacatccaacccgttctggcgtgctgagcgcaggtattaacgccgccagtcggaacaagagctggcaaaaga  
 gttcctcgaaaactatctgctgactgatgaaggcttggaaagcggttaataaagacaaaccgctgggtgccgtagcgtgaagct  
 tacgaggaagagttggcgaaagatccacgtattgccgccaccatggaaaacgccgaaagggtgaaatcatgccgaacatcc  
 cgcagatgtccgcttctggtatgccgtgcgtactgcggtgatcaacgccgccagcggctcgtcagactgtcgtgaagccctga  
 aagacgcgcagactaattcgagctcgaacaacaacaataacaataacaacctcgggatcgaggggaaggatttcagaa  
 ttccgatctcttctctgtggccagcggccctcgagcccgaggagaagccctatgcttgcgggaatgtgtaagtcctca  
 gccagagcagctccctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatctttt  
 agccagagcagcagcctggtgcgccatcaacgcactcacttggcgagaagccatacaaatgtccagaatgtggcaagtcttc  
 agtgattgtcgtgatcttgcgagggaccaacgtactcacaccggggagaagccctatgcttgcgggaatgtgtaagtccttc  
 tcagagctctcacctggtgcgccaccagcgtaccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatcttttag  
 ccgcagcgataacctggtgcgccatcaacgcactcacttggcgagaagccatacaaatgtccagaatgtggcaagtcttttca  
 acttcaggccatttggctccgtcaccaacgtactcacaccggtaaaaaactagtgccaggccggccagtagccgtacgacgtt  
 ccggactacgt

Total: 514 bp

Primer F1-f1 of ZFPm4: 2770 bp to 2850 bp

Primer F1-f2 of ZFPm4: 2740 bp to 2790 bp

Primer F2-f of ZFPm4: 2867 bp to 2940 bp

Primer F2-b of ZFPm4: 2824 bp to 2889 bp

Primer F3-b1 ZFPm4: 2916 bp to 2973 bp

Primer F3-b2 ZFPm4: 2953 bp to 3021 bp

Primer F4-f1 of ZFPm4: 3022 bp to 3102 bp  
Primer F4-f2 of ZFPm4: 2992 bp to 3042 bp  
Primer F5-f of ZFPm4: 3119 bp to 3192 bp  
Primer F5-b of ZFPm4: 3076 bp to 3141 bp  
Primer F6-b1 of ZFPm4: 3168 bp to 3225 bp  
Primer F6-b2 of ZFPm4: 3205 bp to 3273 bp

(17) Partial sequence of pMal-Ap3 (1-3300 bp) and zinc finger protein ZFPap3  
(2719-3270 bp) (SEQ ID NO:18):

ccgacaccatcgaatggtgcaaacctttcgcggtatggcatgatagcggcgggaagagagtcaattcagggtggt  
gaatgtgaaaccagtaacgttatacgaatgctgcagagtatgccggtgtctcttatcagaccgtttcccgctggtgaaccaggcca  
gccacgtttctgcgaaaacgcgggaaaaagtgaagcggcgtatggcggagctgaattacattccaaccgcgtggcacaaca  
actggcgggcaaacagtcgttgctgattggcgttgccacctcagcttggccctgcacgcgccgtcgaaattgtcgcggcgat  
taaactctgcgccgatcaactgggtgccagcgtggtggtgctgatggtagaacgaagcggcgtcgaagcctgtaaagcggcg  
gtgcacaatcttctgcgcaacgcgtcagtggtgatcattaactatccgctggatgaccaggatgccattgctgtggaagctg  
cctgcactaatgttccggcggtattttctgatgtctctgaccagaccccatcaacagtatttttctccatgaagacggtacgcga  
ctgggcgtggagcatctggtcgattgggtcaccagcaaatcgcgtgttagcgggcccattaagtctgtctcggcgcgtctgc  
gtctggctggctggcataaatatctcactcgaatcaaattcagccgatagcggaaacgggaaggcgactggagtccatgtccg  
gttttcaaaaaccatgcaaatgtgaatgagggcatcgttccactgcgatgctggttgccaacgatcagatggcgtgggcgc  
aatgcgcgccattaccgagtcggggtgcgcgttggtgcggatatctcggtagtgggatacgacgataccgaagacagctcat  
gttatatcccgcgttaaccaccatcaaacaggatttctgcctgctggggcaaacaccagcgtggaccgcttctgcaactctctcag  
ggccaggcgggtgaagggaatcagctgttggcgtctcactggtgaaaagaaaaaccacctggcgcccaatacgaaccg  
cctctccccgcgcttggtggcgttgcagctggcacgacaggtttcccgactggaaagcgggcagtgcgcgaacgc  
aattaatgtgagttagctcactcattaggcacaattctcatgtttgacagcttatcatcgactgcacggtgcaccaatgcttctggcgt  
caggcagccatcggaagctgtggtatggctgtgcaggtcgtaaactcactgcataattcgtgtcgtcaaggcgactcccgttct  
ggataatgtttttgcgccgacatcataacggttctggcaaatattctgaaatgagctgttgacaattaatcatcggtcgtataatgt  
gtggaattgtgagcggataacaattcacacaggaaacagccagtcggttaggtgttttcacgagcacttcaccaacaaggacc  
atagattatgaaaactgaagaaggtaaactgtaactctggattaacggcgataaaggctataacggtctcgtgaagtcggtgaag  
aaattcgagaaagataccggaattaaagtcaccgttgagcatccggataaactggaagagaaattcccacaggttgcggcaact  
ggcgtatggccctgacattatcttctgggcacacgaccgcttgggtggtacgctcaatctggcctgttggtgaaatcaccggg  
acaaagcgttccaggacaagctgtatccgtttacctgggatgccgtacgttacaacggcaagctgattgcttaccgatcgtgtt

gaagcgttatcgtgattataacaaagatctgctgccgaacccgccaaaaacctgggaagagatcccggcgctggataaagaa  
 ctgaaagcgaaaggtaagagcgcgctgatgtcaacctgcaagaaccgtacttcacctggccgctgattgctgctgacgggggt  
 tatgctgtcaagtatgaaaacggcaagtacgacattaaagacgtggggcgtggataacgctggcgcgaaagcgggtctgacctc  
 ctggttgacctgattaaaaacaacacatgaatgcagacaccgattactccatcgagaagctgcctttaataaaggcgaaacag  
 cgatgaccatcaacggcccgtgggcgtggccaacatcgacaccagcaaagtgaattatggtgtaacgggtactgccgacctca  
 agggtaaccatccaaaccgttcgttggcgtgctgagcgcaggtattaacgccgccagtcgaacaaagagctggcaaaaga  
 gttcctcgaaaactatctgctgactgatgaaggcttggaagcgggtaataaagacaaaccgctgggtgccgtagcgtgaagtct  
 tacgaggaagagttggcgaaagatccagctattgccgccacatggaaaacgccagaaagtgaaatcatgccgaacatcc  
 cgcagatgtccgcttctggtatgccgtgcgtactgcggtgatcaacgccgccagcggctcgtcagactgtcgtgaagccctga  
 aagacgcgcagactaattcgagctcgaacaacaacaataacaataacaacacctcgggatcgagggaaggatttcagaa  
 ttccgatcctcttctctgtggcccaggcggccctcgagcccggggagaagccctatgcttgcgggaatgtgtaagtcctca  
 gccagagcagctccctggtgcgccaccagcgtacccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatctttt  
 agccagtcagcaacctggtgcgccatcaacgcactcactggcgagaagccatacaaatgtccagaatgtggcaagtctttc  
 agccagtcagcaacctggtgcgccaccaacgtactcacaccggggagaagccctatgcttgcgggaatgtgtaagtccttc  
 agcaccagtggtccttggttagacaccagcgtacccacacgggtgaaaaaccgtataaatgccagagtgcggcaaatctttt  
 agccagcgcgccacctggaacgccatcaacgcactcactggcgagaagccatacaaatgtccagaatgtggcaagtcttt  
 ctcaacttcaggcaacttggtccgtaccaacgtactcacaccggtaaaaaactagtggccaggccggccagtacccgtacga  
 cgttccggactacgt

Total: 514 bp

Primer F1-f1 of ZFPap3: 2770 bp to 2850 bp

Primer F1-f2 of ZFPap3: 2740 bp to 2790 bp

Primer F2-f of ZFPap3: 2867 bp to 2940 bp

Primer F2-b of ZFPap3: 2824 bp to 2889 bp

Primer F3-b1 ZFPap3: 2916 bp to 2973 bp

Primer F3-b2 ZFPap3: 2953 bp to 3021 bp

Primer F4-f1 of ZFPap3: 3022 bp to 3102 bp

Primer F4-f2 of ZFPap3: 2992 bp to 3042 bp

Primer F5-f of ZFPap3: 3119 bp to 3192 bp

Primer F5-b of ZFPap3: 3076 bp to 3141 bp

Primer F6-b1 of ZFPap3: 3168 bp to 3225 bp

Primer F6-b2 of ZFPap3: 3205 bp to 3273 bp

(18) Sequence of oligo m12 (SEQ ID NO:19):

Biotin-GGa gcc tcc ttc ctc ctc tca ctc GGG TTTT CCC gag tga gag gag gaa gga  
ggc tCC

Total: 58 bp

Lower case sequence: ZFPm1 and ZFPm2 binding site m12

(19) Sequence of oligo m34 (SEQ ID NO:20):

Biotin-GGa gcc aac tac tac ggc tcc ctc acc GGG TTTT CCC ggt gag gga gcc gta  
gta gtt ggc tCC

Total: 58 bp

Lower case sequence: ZFPm3 and ZFPm4 binding site m34

(20) Sequence of oligo Ap3 (SEQ ID NO:21):

Biotin-GGt tac ttc ttc aac tcc atc GGG TTTT CCC gat gga gtt gaa gaa gta aCC

Total: 52 bp

Lower case sequence: ZFPap3 binding site

(21) Sequence of oligo NRI-1 (SEQ ID NO:22):

Biotin-GG ttc tac ccc tcc cac cgc GGG TTTT CCC gcg gtg gga ggg gta gaa CC

Total: 51 bp

(22) Sequence of oligo NRI-2 (SEQ ID NO:23):

Biotin-GG tgc ggc gac tgc agc agc GGG TTTT CCC gct gct gca gtc gcc gca CC

Total: 51 bp

(23) Sequence of oligo hHD-I (SEQ ID NO:24):

Biotin-GG ggc ccc gcc tcc gcc ggc GGG TTTT CCC gcc ggc gga ggc ggg gcc  
CC

Total: 51 bp

(24) Sequence of oligo hHD-II (SEQ ID NO:25):

Biotin-GG ggc agc ccc cac ggc gcc GGG TTTT CCC ggc gcc gtg ggg gct gcc CC

Total: 51 bp

(25) Sequence of oligo c5p1-g (SEQ ID NO:26):

Biotin-GG gac acc ccc aac ccc gcc GGG TTTT CCC ggc ggg gtt ggg ggt gtc CC

Total: 51 bp

(26) Sequence of oligo c5p3-g (SEQ ID NO:27):

Biotin-GG ctc tgc tca tcc cac tac GGG TTTT CCC gta gtg gga tga gca gag CC

Total: 51 bp

(27) Sequence of oligo B3c2 (SEQ ID NO:28):

Biotin-GG acc cac cgc gtc ccc tcc GGG TTTT CCC gga ggg gac gcg gtg ggt CC

Total: 51 bp

(28) Sequence of oligo e2c-g (SEQ ID NO:29):

Biotin-GG cac tgc ggc tcc ggc ccc GGG TTTT CCC ggg gcc gga gcc gca gtg CC

Total: 51 bp

(29) Sequence of primer Ap3-F (SEQ ID NO:30):

GGCGAGAGGGAAGATCCAG

Total: 19 bp

(30) Sequence of primer NZlib5' (SEQ ID NO:31):

GGCCCAGGCGGCCCTCGAGC

Total: 20 bp

(31) Sequence of primer Ap3f4-R (SEQ ID NO:32):

CTCCTCTAATACGACTCACTATAGGGACACTCACCTAGCCTCTG

Total: 44 bp

(32) Sequence of primer m4f3-R (SEQ ID NO:33):

CCTCGCAAGATCACGACAATC

Total: 21 bp

(33) Sequence of quantitative PCR probe for AP3 (SEQ ID NO:34):

CCATTTTCATCCTCAAGACGACGCAGCT

Total: 27 bp

(34) Sequence of quantitative PCR primer for AP3 (Forward) (SEQ ID NO:35):

TTTGACGAGCTTGACATTCAG

Total: 22 bp

(35) Sequence of quantitative PCR primer for AP3 (Reverse) (SEQ ID NO:36):

CGCGAACGAGTTTGAAAGTG

Total: 20 bp

(36) Sequence of 2C7-SID (Figure 3) (SEQ ID NO:66):

gacggatcgggagatctccgatccccctatggtcgactctcagtacaatctgctctgatgcccatagttaagccagta  
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